DYNISCO UPR900
GRAPHICAL ¼ DIN PROCESS INDICATOR
CONCISE PRODUCT MANUAL (59479 - 02)

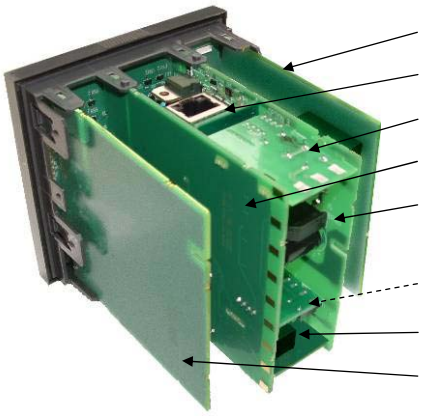
The following symbols are used on the product labels:

⚠	***Caution, refer to installation manual when connecting*** **General danger to life or limb**	⧈	***Equipment protected through-out by double insulation***
~	***Alternating current***	⎓	***Both direct and alternating current***

1. INSTALLATION

⚠ **CAUTION: Installation should be only performed by technically competent personnel. It is the responsibility of the installing engineer to ensure that the configuration is safe. Local regulations regarding electrical installation & safety must be observed - e.g. US National Electrical Code (NEC) and/or Canadian Electrical Code. Impairment of protection will occur if the product is used in a manner not specified by the manufacturer.**

Installing Option Modules



To access the option modules, first pull the instrument from the housing.

a. Detach the main boards by lifting first the upper, and lower mounting struts.
b. Plug the required option modules into the correct connectors, as shown below.
c. Locate the module tongues in the corresponding slot on the opposite board.
d. Hold the Power and Input boards together while relocating on their mountings.
e. Push the boards forward to ensure correct connection to the Display board.
f. Replace the instrument by aligning the boards with the guides in the housing, and then slowly push he instrument back into position.

Note: Option modules are automatically detected at power up.

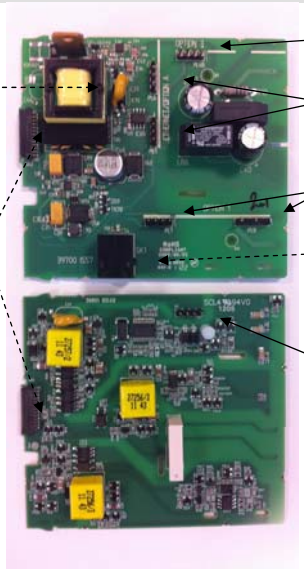
Main Board Connectors

POWER SUPPLY BOARD
Transformer Colour Code
100-240V (Yellow)
24-48V(Blue)

Display Board Connections

UNIVERSAL INPUT BOARD

Note: *Plastic pegs prevent fitting of older non-reinforced single relay modules – remove the peg to fit dual relays*



Option 3 Slot Connector PL4B

Option Slot A Connectors PL5, & PL6

Option 1 Slot Connectors PL7 & PL8

PC Configurator Socket SK1

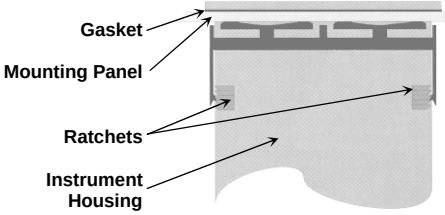
Option 2 Slot Connector PL4A

Replacement of Main Boards

⚠ **CAUTION: Replacement of main boards should only be carried out if unavoidable, and must only be carried out by trained personnel.**

When replacing the power supply board, observe the transformer colour and case labelling to **check the supply voltage**, otherwise irreparable damage may occur.
If the display or input boards are replaced, a full recalibration **must** be carried out

Panel Mounting



Slide mounting clamp over the instrument housing towards rear face of mounting panel until the tongues engage in ratchets and instrument is clamped in position.

Hold instrument firmly in position (apply pressure to bezel only)

⚠ **CAUTION: Do not remove the panel gasket; it is a seal against dust and moisture.**

Rear Terminal Wiring

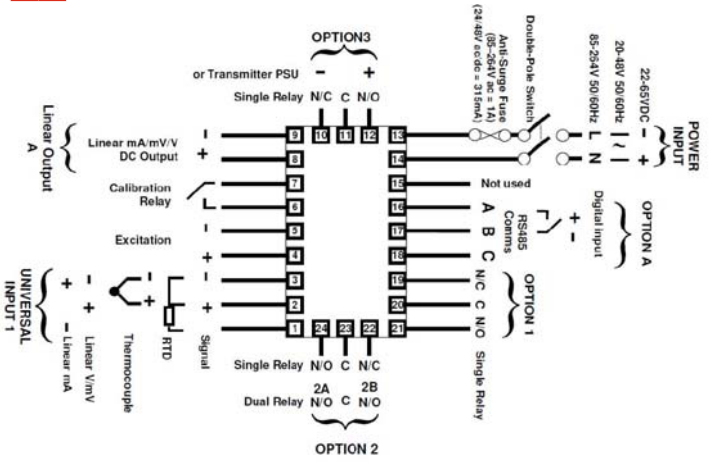
⚠ **CAUTION: The instrument is double insulated. All external circuits connected must provide double insulation.**
Failure to comply with the installation instructions may impact the protection provided by the unit.

Note: The wiring diagrams show all possible option combinations. The connections required depend on the options fitted. Use single strand (1.2mm / AWG18 max size) copper wire, except for the thermocouple input, where the correct thermocouple or compensating cable and connectors should be used.

Main Terminals

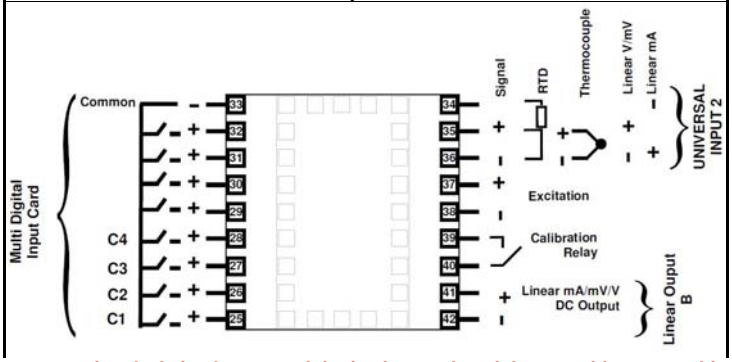
⚠ **CAUTION: Check correct operating voltage on the side label before connecting power. A UL listed 1A anti-surge fuse, rated 250V (for AC) 65V (for DC) should be fitted to the power input. An IEC60947-1 & IEC60947-3 compliant isolation switch should be fitted close to the unit, in easy reach of the operator, and appropriately marked.**
All connections to the device must be made through a spade format or similar connection, with connection to the spade terminal touching both the insulation and conductor material.(Use a standard crimping tool)All connections must be Mechanically secured so as to prevent any wiring becoming loose and coming in contact with other wires or the instrument casing

⚠ ***The above applies to any and all connection to hazardous mains supply either direct or indirect (Through a switch (Relay))***



⚠ **CAUTION: External computing devices connected to the communications port must comply with the standard, UL 60950.**

Additional Option Terminals



⚠ **Electrical shock can result in death or serious injury. Avoid contact with the leads and terminals. High voltages that may be present on leads can cause electrical shock**

2. SPECIFICATIONS

PROCESS INPUTS 1 AND 2

Sampling Rate:	Better han 10 times per second.
Resolution:	16 bits. Always four times better than display resolution.
Impedance:	>10MΩ resistive, except DC mA (5Ω) and V (47kΩ).
Temp Stability:	Error <0.01% of span per °C change in ambient temperature.
Supply Variation:	Supply voltage influence negligible within supply limits.
Humidity Influence:	Negligible if non-condensing.
Process Display:	Displays up to 5% over and 5% under span limits.
Process Variable Input Offset:	Reading adjustable ± Controller Span. +ve values added to Process Variable, -ve values subtracted from Process Variable
Sensor Break Detection:	*High or Low range break activates as per user definition(default is to Break to a High scale range)*
Isolation:	Isolated from all outputs and other input at 240V AC.

Strain Gauge Inputs	350 to 5K Ω Strain Gage Bridge Connec ion 4 or 6 wire (6 to use internal shunt cal switch) Bridge Excitation 10 V +/- 7% Bridge Sensitivity 1.4 - 4 mV/V Input Signal Span - 25% to +125% of full scale (approximately -10 mV to +50 mV) Calibration Internal switch between CAL2 & CAL1 terminals (7&6 or 39&40). External resistor only. Shunt Value From 40% to 100%

Supported Thermocouple Types & Ranges:	Type	Range °C	Range °F	
	B	0 to 1824°C	32 to 3315°F	
	C	0 to 2320°C	32 to 4208°F	
	D	0 to 2315°C	32 to 4199°F	
	E	-240 to 1000°C	-400 to 1832°F	
	J	-200 to 1200°C	-328 to 2192°F	*
	K	-240 to 1373°C	-400 to 2503°F	*
	L	0 to 761°C	32 to 1402°F	*
	N	0 to 1400°C	32 to 2552°F	*
	PtRh 20%:40%	0 to 1850°C	32 to 3362°F	
	R	0 to 1759°C	32 to 3198°F	
	S	0 to 1762°C	32 to 3204°F	
	T	-240 to 401°C	-400 to 754°F	*

Optional decimal place can be displayed up to 999.9°C/F

Thermocouple Calibration:	±0.1% of full range, ±1LSD (±1°C for internal CJC if enabled). Linearization better than better ±0.2 C (±0.05 typical) on ranges marked * in he table above. Linearization for other ranges is better than better than ±0.5 C. BS4937, NBS125 & IEC584

Supported RTD Types & Ranges:	Type	Range °C	Range °F
	3-Wire PT100	-200 to 800°C	-328 to 1472°F
	NI120	-80 to 240°C	-112 to 464°F

Optional decimal place can be displayed up to 999.9°C/F

RTD Calibration:	0.1% of full range, ±1LSD. Linearization better than ±0.2 C (±0.05 typical). PT100 input to BS1904 & DIN43760 *(0.00385Ω/Ω°C).*
RTD Excitation:	Sensor current 150µA ±10%.
Lead Resistance:	<0 5% of span error for max 50Ω per lead, balanced.

Supported Linear Types & Ranges:	Type	Range	Offset Range
	mA DC	0 to 20mA DC	4 to 20mA DC
	mV DC	0 to 50mV DC	10 to 50mV DC
	V DC	0 to 5V DC	1 to 5V DC
	V DC	0 to 10V DC	2 to 10V DC

Scalable from -2000 to 100000. Decimal point selectable from 0 to 3 places, but limited to 5 display digits (e.g. 9999.9)

Maximum Overload:	1A on mA input terminals, 30V on voltage input terminals.
DC Calibration:	±0.1% of full range, ±1LSD.
DC Input Multi-Point Linearization:	Up to 15 scaling values can be defined anywhere between 0.1 and 100% of input.

DIGITAL INPUTS

Volt-free contacts (or TTL):	Open contacts (>5000Ω) or 2 to 24VDC signal = Logic High Closed contacts (<50Ω) or -0.6 to +0.8VDC signal = Logic Low.
Isolation:	Reinforced safety isolation from inputs and other outputs.
Digital Input Sensitivity:	Edge Sensitive. Requires High-Low or Low-High transition to change function.
Response Time:	Slot A <0.25 second,

Selectable Digital Input Functions:	Function	Logic High	Logic Low
	Peak Reset	No Action	Reset Peak reading
	Alarm and Peak Reset	No Action	Reset Peak reading and Resets latched alarm if alarm conditions no longer exists
	Zero Calibration	No Action	Perform zero Calibration
	Zero Calibration, Alarm and Peak Reset	No Action	Perform zero Calibration, Reset Peak reading and Resets latched alarm if alarm conditions no longer exists
	Reset Latched Alarms	No Action	Resets latched alarm if alarm conditions no longer exists
	Data Recorder	Stop Recording	Start Recording

OUTPUTS

Caution: *Plastic pegs prevent fitting of older non-reinforced single relay modules – Remove the peg to fit dual relays (all dual relay modules have reinforced isolation)*

Single Relay

Type & Rating:	Single pole double throw (SPDT); 2A resistive at 120/240VAC.
Lifetime:	>500,000 operations at rated voltage/current.
Isolation:	Reinforced safety isolation from inputs and other outputs.

Dual Relay

Type & Rating:	Single pole single throw (SPST), 2A resis ive at 120/240VAC. Dual relay modules have shared common.
Lifetime:	>200,000 operations at rated voltage/current.
Isolation:	Reinforced safety isolation from inputs and other outputs.

Linear DC

Ranges	0 to 5, 0 to 10, 1-5, 2 to 10V & 0 to 20, 4 to 20mA (selectable) with 2% over/under-drive when used for control outputs.
Resolution:	15 3/4 bit (1 part in 52K)
Accuracy:	0 to 20mA, 4 to 20mA into 500Ω max, 0 to 10V, 2 to 10V, 0 to 5V into 500Ω min. Updated at about 65ms intervals. (130ms settling time)Stability: ± 76ppm
Isolation:	Reinforced safety isolation from inputs and other outputs.

Transmitter PSU

Power Rating:	24V nominal (18 to 28V DC) into 400Ω minimum resistance (60mA Drive). (*Option to use DC Linear output as 0-10V stabilised PSU*).
Isolation:	Reinforced safety isolation from inputs and other outputs.

COMMUNICATIONS

PC Configuration

Connection:	RS232 via PC Configurator Cable to RJ11 socket under case.
Isolation:	Not isolated from input or SSR Driver outputs. For bench configuration only. **CAUTION:** Do not use in live applications.

RS485

Connection:	Locates in Option Slot A. Connection via rear terminals (*refer to wiring diagram*).
Protocol:	Modbus RTU.
Slave/Master Mode	Slave address range 1-255 or Setpoint master mode.
Supported Speeds:	4800, 9600, 19200, 38400, 57600 or 115200 bps.
Data Type:	8 data bits and 1 stop bit. Odd, even or no parity.
Isolation:	240V reinforced safety isolation from all inputs and outputs.

Ethernet

Connection:	Locates in Option Slot A. Connection via RJ45 connector on top of case.
Protocol:	Modbus TCP. Slave only.
Supported Speed:	10BaseT or 100BaseT
Isolation:	240 V reinforced safety isolation from the supply, inputs and outputs (except SSR Drivers).

ALARMS

Alarm Types:	Up to 3 alarms selectable as Process High, Process Low, Rate of Signal Change (per minute), Sensor/input Break,
Alarm Hysteresis:	A deadband from 1 LSD to full span (in display units) for Process.Rate Of Change Alarm hysteresis is the shortest time (1 to 9999 secs) the rate of change must be above the threshold for the alarm activate, or fall below the threshold to deactivate. **Note:** If the duration is less han this time, the alarm will not activate no matter how fast the rate of rise.
Combined Outputs:	Logical OR of alarms 1 & 2, 1 to 3,

OPERATING CONDITIONS (FOR INDOOR USE)

Temperature:	0°C to 55°C (Operating), –20°C to 80°C (Storage).	
Relative Humidity:	20% to 95% non-condensing.	
Supply Voltage and Power:	*Mains versions:*	100 to 240VAC ±10%, 50/60Hz, 24VA.
	Low voltage versions:	20 to 48VAC 50/60Hz 15VA or 22 to 65VDC 12W.

CONFORMANCE NORMS

EMI:	CE: Complies with EN61326.
Safety Considerations:	CE: Complies with EN61010-1. UL, cUL to UL61010C-1. Pollution Degree 2, Installation Category II.
Front Panel Sealing:	To IP66 (IP65 front USB connector). *IP20 behind the panel. (IP rating not recognised / approved by UL).*
Front Panel Cleaning	Wash with warm soapy water and dry immediately. *Close the USB cover (if fitted) before cleaning.*

DISPLAY

Display Type:	160 x 80 pixels, monochrome graphic LCD with a dual colour (red/green) backlight.
Display Area:	66.54mm (W) x 37.42mm (H).
Display Characters:	0 to 9, a to z, A to Z, plus ( ) - and _
Trend View:	120 of 240 data points shown in a scrollable window. Data is not retained when power turned off or if time base is changed.
Trend Data:	Any active alarm plus PV (solid) & SP (dotted) at sample time or Max/Min PV between samples (candle-stick graph). Auto scales from 2 to 100% of Input Span.
Trend Sample Rate:	1; 2; 5; 10; 15; 30 seconds or 1; 2; 5; 10; 15; 30 minutes.

DIMENSIONS

Weight:	0.65kg maximum.
Size:	96 x 96mm (Front Bezel). 117mm (Depth Behind Panel).
Mounting Panel:	Panel must be rigid. Maximum thickness 6.0mm (0.25inch).
Panel Cut-out Size:	92mm x 92mm. Tolerance +0.5, -0.0mm.
Ventilation	20mm gap required above, below and behind.

Manufacturing Site

Address	The Hyde Business Park, Brighton, BN2 4JU, United Kingdom

3. POWER UP SEQUENCE

Following the power-up self-test and logo screen, the instrument normally enters Operation Mode, from which the user can select the instrument's Main Menu (*refer to the Screen Sequence list*). The exceptions to this are the first power-up after purchase, when option modules have been changed or if an error is detected.

Setup Wizard

An easy **Setup Wizard** runs automatically at first ever power-up. Follow the Wizard to setup parameters required for typical applications (*screens marked* **w** *in the Screen Sequence list*). A partial Wizard also runs whenever option modules have been changed, this only shows parameters affected by the changes. The Wizard can also be run from the Main Menu. It exits to Operation Mode once completed.

Start-Up Errors

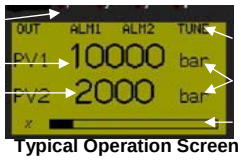
These messages indicate that a hardware or configuration an error has occurred.
***Caution:* Do not continue with the process until the issue is resolved.**

Message Displayed	Reason
Option Slot *n* Error	Fault detected. Replace the module in slot *n*
Configuration Problem	Check all instrument parameters before using
For Service Contact	Details of who to contact if a fault persists

4. OPERATION MODE

This mode is entered at power on, or accessed from the Main Menu. If required, all Operation Mode parameters can be made read only *(see Display Configuration)*.
Note: Configuration must be completed before starting normal operations.

Normal Operation

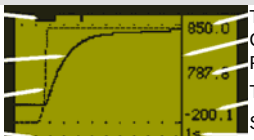


LED Indicators
Process Variable Value 1
Process Variable Value 2
LED Function Labels
Engineering Units
Input as Percentage of Span
Span

Typical Operation Screen

Subsequent screens allow the display and selection/adjustment* alarm status and trends.
Press ▪ or ◘ to move forward or back though the screens.
Where adjustment is possible*, press ▼ or ▲ to alter the values.
**If adjustment is not disabled in Configuration.*

Trend View



Active Alarm(s)
Process Variable Trend
Setpoint Trend (*dotted*)
Time Markers
(10 samples per marker)
Trend Upper Scale Value
Cursor Line
PV Value At Cursor Line
Trend Lower Scale Value
Sample Interval *(or Time At Cursor Line)*

Trend View

Trend View graphs PV; or Max/Min PV between samples, plus active alarms. Trend Scale Values adjust automatically to visible data (between 2 to 100% of the input span). Sample intervals are set in Display Configuration.
Pressing ▼ or ▲ moves the Cursor Line back through the last 240 data points.
Note: Data is not retained at power down or the Sample Interval is changed.

Over/Under Range & Input Fail Indications

If the process or auxiliary inputs are >5% above or below the scale max/min, their displayed value is replaced with the word "**HIGH**" or "**LOW**".
If a signal break is detected, their value is replaced with "**OPEN**" and an un-calibrated input is replaced by "**ERROR**". In OPEN or ERROR conditions, the *Control Outputs go to the pre-set power value (see Control Config)...*
***Caution:* Correct the problem before continuing normal operation**.

5. SERIAL COMMUNICATIONS

Set Ethernet option IP address with supplied software for networks without DHCP
Refer to he User guide (from your supplier) for help with communications.

6. STRAIN GUAGE CALIBRATION MODE

Press the ▼ + ▪ to enter calibration mode from any location for quick access (see Strain Gauge Calibration in Configuration Mode)
Only applicable when Sensor input type is set to Strain Gauge

7. SCREEN SEQUENCES

The parameters displayed depend on how the instrument has been configured. After 2 minutes without key activity, most screens revert to the next higher menu level, until reaching the base Operation Mode display. **Note:** Additional screens will be displayed if the USB, Profiler or Recorder Options are fitted - *Refer to the Supplementary Manual*.
Screens marked ◷ persist unless changed by the user. Screens marked **W** are also included in the Setup Wizard. Menus marked 🔒 = Require a un-lock code for access.

Screen Navigation

◘ = Accept Value & Move Back ▼ = Next Item/Increment ▲ = Prior Item/Decrement ▪ = Accept Value & Move Forward ▲ + ▪ = Move Up One Menu Level
The symbols ◆ are showed to the right of the lists when more menu options are available above ▲ or below ▼.

Select Main MenuS Option from list. Press ▪ to continue. - Press ◘ + ▪ to move from Operation Mode to Main Menu

MAIN MENU OPTIONS

	Operation Mode		
	Base operating screen. *LED Labels; PV value(s);Bar Graph*	◷	LED Labels = LED indicator functions. Defaults are ALM1, ALM2 & TUNE - *these labels can be altered with configuration software* Bar Graph = Input 1 percentage of Span (Values shown depend on configuration Display parameters)
	Peak Display Screen(s)		PV1 or PV2 and the Peak value(Peak Max or Min values shown depend on configuration Display parameters)
	Alarm Status		Active / inactive status of all configured Alarms.
	Trend View(s)	◷	A trend graph of PV1 PV2 or Differential or the Max/Min value of the PV between samples. Any active alarm(s) are indicated at the top of the graph.(Values shown depend on configuration Display parameters)
	- *Custom Display screens …*		Up to 50 Configuration parameters can be copied into Operation Mode using the PC software. In this mode they are **not pass code protected**.
			Note ***Operation Mode screens can be made globally read only from Display Configuration***
🔒	**Setup Wizard**		
	Setup Wizard Unlocking	**w**	Enter correct code number to access Setup Wizard. *Default Value = 10*
	- *Screens marked* **w** …	**w**	Press ▪ to select each major configuration parameter in turn. Follow the on-screen prompts to alter the values.
	Setup Wizard Completed	**w**	Confirms completion of the Setup Wizard. Exits to Operation Mode.
🔒	**Supervisor Mode**		
	Supervisor Mode Unlocking		If Supervisor Mode is configured (*requires PC software*), enter correct code number to continue. *Default Value = 10*
	- *Supervisor Mode Screens …*		Press ▪ to select up to 50 Configuration parameters in turn. Follow on-screen prompts to alter the values.
🔒	**Configuration Menu**		
	Configuration Mode Unlocking		Enter correct code number to access Configuration Mode. *Default Value = 10*
	Configuration Options		Select required Configuration Menu Option from list. Press ▪ to continue.
	Refer to the Configuration Menu screens sequences opposite for information about the Configuration Sub-Menus.		
🔒	**USB Menu**		
	USB Mode Unlocking		Enter correct code number to access USB Menu. *Default Value = 10*
	Read/Write To USB Device?		From: Read/Write Configuration File; Read/Write Profile File or Write Recorder Log File.
Write	Enter A File or Folder Name		Enter an 8-character folder name for logs, or a file name for configurations and profiles. An extension (.bct for configurations, .pfl for profiles) is added automatically. **Caution** Existing files/folders with the same name will be over-written.
Write	Writing Configuration File		The file is being written. **Caution** Do not disconnect USB device until completed! Data loss or corruption may result.
Write	Transfer Successful		Confirmation of successful data transfer. Press ▪ to continue
Read	Select File		Select the Configuration file to transfer from the USB stick. **Caution** A configuration read overwrites all existing instrument settings.
Read	Reading Configuration File		The file is being read. **Caution** Do not remove the memory stick whist this operation is in progress. Data loss or corruption may result.
Read	Transfer Successful		Confirmation of successful data transfer. Press ▪ to continue
Read	Transfer Failure		For write failures, check the disk space on the USB stick. For read failures, check the maximum number of profiles/segments is not being exceeded.
🔒	**Recorder Control**		
	Recorder Mode Unlocking		Enter correct code number to access Data Recorder Menu. – *If Log Trigger is Recorder Menu Start/Stop. Default Value = 10*
	Recording In Progress Warning		If recording in progress when Recorder Menu entered. - *Access to the Start/Stop or Abort screens only until the recording is stopped.*
	Start/Stop Data Recording		Manually Stop, or Start a new recording. – *If Log Trigger is Recorder Menu Start/Stop.*
	Abort Recording		Forces a recording to Stop, overriding the selected record trigger. – *If Log Trigger is During Alarms; Digital Input A or B; or During Profile.*
	Delete Recording		Clears the recorder memory. **Caution** Permanently removes **All** recorded data.
	Product Information Mode		
	Input(s)Calibration Status		Calibration status of mVDC, VDC, mADC, RTD and Thermocouple CJC inputs. *All should be "Calibrated".*
	Calibration Check Due Date		Date re-calibration is due. - *If Calibration Reminder Enabled in Inputs Configuration.*
	Option Slot *n* Information		Type of Option Modules (*if any*) fitted in Option Slot s 1-4, A or B
	Units Feature Information		Display Only; USB Port; Data Recorder (*includes USB Port*).
	Firmware Information		Type and version of firmware.
	Serial Number Information		Instrument serial number.
	Date of Manufacture		Date of Manufacture
	Service Information Mode		
	For Service Contact		Contact information for Service, Sales or Technical Support.

CONFIGURATION MENU OPTIONS

Select required Main Menu Option from list. Press ▶ to continue. - Press ◀ + ▶ to move back to Main Menu

Input Configuration		
Input *n* Setup		
Process Variable Input Type	**w**	From Strain Gauge, Thermocouple, RTD and Linear inputs. - *see specifications section for details.*
Engineering Units	**w**	Select display units from: °C; °F; °K; bar; %; %RH; pH; MPa; KGcm; psi or none.
Decimal Point Position	**w**	Display resolution with 0 1 2 or 3 decimal places. Temperature inputs are limited to 1 decimal place.
Multi-Point Scaling Enable		Enables/disables Linear Input Multi-Point Scaling.
Scale Range Lower Limit	**w**	Sets the usable span (min = 100 units, max = range limits - *see specs)* for temperature inputs. For Linear inputs, Upper & Lower Limits define the
Multi-Point Scale Point(s)		Values shown (-1999 to 100000) when input is at minimum and maximum values. Min span = 100 units. If Multi-Point Scaling is enabled, up to 15
Scale Range Upper Limit	**w**	Breakpoints* can scale input vs. displayed value, between the linear input scale limits. *A breakpoint set at 100% input ends the sequence.
Input Filter time		Filter unwanted noise from input signal. Adjustable from 0.5 to 100.0 seconds (default = 0.5s). **Caution** Use with care!
Input Failure Mode		Set to Fail High or Fail Low on sensor break
Input Peak Detection		Disabled Maximum Peak or Minimum Peak
CJC Enable/Disable		Enables/disables internal Thermocouple Cold Junction Compensation. The default value is Enabled.
Process Variable Offset		Trims the PV. +Ve values add to, –Ve values subtract from measured input. **Caution** Use with care!
Input *n* Calibration (viewed when temperature input type selected)		
Calibration Type		Select from: Factory, single point and Two point Calibration
Calibration Offset		Enter value to offset input signal by, from off (no off set applied) to + ve or – ve maximum of input Span
Calibration Low Temp & Low Offset		Enter the value at which you conduct the low end calibration and required offset for calibration
Calibration High Temp & High Offset		Enter the value at which you conduct the High end calibration and required offset for calibration
Calibration reminder		
Calibration reminder		Enable or Disable Calibration reminder
Calibration Reminder Date		Set the date that the Calibration reminder is due
Digital Input Function Select		
Digital input C1...4		Choose from the following: Input 1,2 or 1+2 Peak reset, Input, Alarm Reset, Input 1,2 or 1+2 Alarm and Peak reset, Input 1,2 or 1+2 Zero Calibration Input 1 2 or 1+2 Zero Calibration Alarm and Peak reset Data Recorder Start/Stop*.
Strain Gauge Calibration		
Input *n* Shunt resistor		Enabled or Disable Default : Enabled
Input *n* Calibration resistor Percentage		Set the percentage of range the calibration shunt resistor needs to be set at between 40%and 100%. Default 80%
Start Input *n* Low Point Calibration		Press ▼ +▲ keys to begin calibration procedure
Start Input *n* High Point Calibration		Press ▼ +▲ keys to begin calibration procedure (Can only be accessed once a successful low calibration has been completed)
Error Messages		**Count Fail** means the low calibration will fail if the offset is less than -10mV or greater than +10mV. This signifies potential faulty sensors or the high calibration will fail if the count value is less than +20mV or greater than +50mV. This signifies potential faulty sensors **RCal Fail** means the high calibration will fail if the mV value is within 10mV of the low calibration value. This is a potential RCAL failure.
Output Configuration		
Linear Output *n* Type	**w**	From: 0-5, 0-10, 1-5, 2-10V & 0-20, 4-20mA or 0-10VDC adjustable Transmitter PSU.
Adjustable 0-10V Transmitter PSU *n*	**w**	Voltage required if Output *n* is 0-10VDC adjustable Transmitter PSU.
Output *n* Usage	**w**	From: Alarms; Retransmit Process Variable.
Output *n* Alarm Selection	**w**	Alarm 1; 2; 3; or Logical OR of alarms 1 to 2; 1 to 3; Selectable Direct or Reverse Action.
Retransmit Output *n* Scale Low	**w**	Displayed value at which the retransmission output = minimum. Adjustable from -1999 to 9999.
Retransmit Output *n* Scale High	**w**	Displayed value at which the retransmission output = maximum. Adjustable from -1999 to 9999.
Alarm Configuration		
Alarm *n* Type	**w**	From: Unused; High; Low; Rate Of Signal Change per minute; PV Signal Break; Percentage of Memory Used
Alarm n Input Selection		From: Universal Input 1 or 2
Alarm *n* Value	**w**	Alarm activation point. – *applicable if type is High; Low;*
Alarm *n* Hysteresis		Deadband on "safe" side of alarm, through which the signal must pass before alarm deactivates.
Signal change Alarm *n* Min. Duration		Minimum time the rate of PV change must be above the alarm threshold for a Rate Of Change Alarm to change state (on or off). 1 to 9999 secs.
Alarm *n* Inhibit		Prevents alarm activation if the alarm condition is true at power up. *Activation occurs only after the condition has passed and then reoccurred.*
Percentage of Memory used		0-100%
Alarm n Filter Time		Filter the time the alarm needs to be active for the action to take place from 0 5s to 100s
Communications Configuration		
No Comms Warning		If Communications Configuration menu is entered without a communications module fitted.
Modbus RTU Parity	**w**	From: Odd; Even or None.
Modbus RTU Data Rate	**w**	From: 9600; 19200; 57600 or 115200 bps.
Master Mode, or Slave Address	**w**	Slave address (1 to 255), or multi-zone Setpoint Master Mode.
Master Mode Format		The data format required by the attached setpoint slaves. From: Integer; integer with 1 decimal place & float.
Serial Communications Write Enable		Enables/disables writing via RS485 or Ethernet (*if fitted*). When disabled, all parameters are read only.
Recorder Configuration		*Refer to the Supplementary Product Manual for information about the additional screens when Data Recorder is fitted.*
No Recorder Warning		If the Recorder Configuration menu is entered on an instrument without this option.
Recording In Progress Warning		If recording in progress when Recorder Configuration entered. - *Access to the Start/Stop or Abort screens only until the recording is stopped.*
Recording Mode		Record Until Memory Used (Stop recording when full) or Continuous FIFO (First In - First Out - overwrites oldest data when full).
Recording Sample Interval		From: Every 1; 2; 5; 10; 15; 30 Seconds, or Every 1; 2; 5; 10; 15; 30 Minutes.
Recorder Trigger		The recording Start/Stop trigger method. From: Operation Mode; Recorder Menu; On Alarm; Digital Input.
Trigger On Alarms		Any from: Alarm *n* – Where *n* is alarms 1 to 5. Any combination of these can be set to trigger (TRG) or not (OFF).
Values To Record		Any from: Process Variable value; Maximum or Minimum PV (since previous sample).
Events To Record		Any from: Alarm *n* Status or Unit On/Off. ***Note:*** *An alarm state change between samples is also recorded. This uses additional recorder memory.*
Recorder Status Information		Shows if a recording is in progress; the recording mode; memory usage per sample; memory remaining and approximate recording time remaining.
Recorder Clock Configuration		*Refer to the Supplementary Product Manual for information about the additional screens when Data Recorder is fitted.*
Date Format	**w**	The format used for displayed dates: dd/mm/yyyy (*Day / Month / Year*) or mm/dd/yyyy (*Month / Day / Year*). – *Recorder versions only*.
Set Date	**w**	Sets the internal clock Date. – *Entered in the format defined by Date Format screen. – Recorder versions only*.
Set Day Of Week	**w**	Sets the day of week used by the internal clock. – *Recorder versions only*.
Set Time	**w**	Sets the internal clock Time. - *In hh:mm:ss (Hours : Minutes : Seconds) format. – Recorder versions only*.
Display Configuration		
Enable Custom Display Mode		Enables/disables Custom Operation Mode, if configured (*requires PC configuration software*).
Read Only Operation Mode?		Allows Operation Mode to be Read-Only or Read/Write. Screens can be seen but, values cannot be changed if Read-Only.
Operation Mode Bar Graph Format		From: PID Power or Control Deviation or.
Trend Sample Interval		Interval between display of next value on the trend graph From: Every 1 2 5 10 15 30 Seconds or Every 1 2 5 10 15 30 Minutes.
Select Trend Mode		From: PV only, or Max/Min PV between samples (candle-stick graph). Alarm activity is always shown.
Display Colour		From: Red only; Green only; Red to Green on Alarm or Green to Red on Alarm.
Invert Display		Standard or Negative display image.
Display Contrast		Screen contrast (0 and 100) to improve clarity. 100 = maximum contrast.
Language		Select English or the alternate local language. The alternate language type can be changed using the PC software.
Lock Code Configuration		
Lock Code View 1		View and edit the Setup Wizard; Configuration Mode Supervisor Mode USB Menu and Recorder Menu Lock Codes (1-9999 or OFF). *Default Values = 10*
Reset To Defaults		
Reset To Defaults		Set all parameters to default values. **Caution** User must reconfigure all required settings before using the instrument following a reset.

***Both Recorder Trigger state and Digital input selection must be the same to start recording**